1096-H1-316 **John Sadowsky*** (john.sadowsky@jhu.edu), Zeta Associates Incorporated, 10302 Eaton Place, Fairfax, VA 22030. *An Application of Computational Algebraic Geometry to Real-World Signal Processing Problems in an Industrial Organization.* Preliminary report.

Computational Algebraic Geometry is an exciting field of mathematics that has experienced significant research and development activity over the past 25 years. New algorithms for Groebner bases, reducing Sylvester matrices, and so forth have resulted symbolic algebraic approaches to algebraic varieties, the zeros of systems of multivariable polynomials. These results could as well apply to real-world problems in industry, in which systems producing detected signals are modeled as intersections of systems of multivariable polynomials. Usually, such problems are handled by methods of iteratively approximating the intersections, because the computational algebraic geometry requires exact values of coefficients and exact arithmetic, but in the real world, measurements are approximate and computer arithmetic approximates the real field as floating point, both in representation and computation. There are times, however, when it is important to understand the geometry of the algebraic variety and not simply numeric values for some of the zeros in that variety. This talk will present experience in industry with developing algorithms to solve such problems, combining the algebraic geometric algorithms with numerical techniques and a multi-precision library of C++ arithmetic functions. (Received August 27, 2013)